

## SUMMARY OF THE INVENTION

The present invention is directed to a system and method for building a consumable part refill, which may be a staple refill, the method comprising the steps of fabricating an array of consumable parts, detachably connected along a first direction, stacking a plurality of such fabricated arrays of parts, or staple wire plates, along a second direction, and providing an adhesive bond between adjacent ones of this stacked plurality of arrays.

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## BRIEF DESCRIPTION OF THE DRAWING

FIGURE 1 is an isometric view of the application of adhesive to the upper surface of the uppermost sheet of a stack of staple wire sheets according to a preferred embodiment of the present invention;

5 FIGURE 2 is a bottom view of a staple refill placed in a staple cartridge according to a preferred embodiment of the present invention;

FIGURE 3 is a cut-away view of the advancement of the lowest sheet of a staple refill by an advancement mechanism according to a preferred embodiment of the present invention;

FIGURE 4 is an isometric view of the bottom of a staple refill coupled to an advancement mechanism according to a preferred embodiment of the present invention;

FIGURE 5 is an isometric view of the top of a staple refill coupled to an advancement mechanism according to a preferred embodiment of the present invention; and

FIGURE 6 is a close up cut-away view of the advancement of the lowest sheet of a staple refill according to a preferred embodiment of the present invention.

## DETAILED DESCRIPTION

The present invention is directed to a system and method for providing a waste-free refill of consumable parts for use within a machine. When providing a staple wire refill for a copy machine, the inventive approach involves inserting a package of staple wires bound together by a mechanism, such as a fastener, which is preferably entirely consumed in the stapling process, thereby obviating a need to remove waste material, such as a disposable staple container, from such copy machine subsequent to insertion of such a refill.

In a preferred embodiment, a staple refill or package is mechanically bonded together along a first dimension, such as through the use of a preferably brittle glue or a perforated metal connection, and bonded along a second dimension through the use of glue or other adhesive. Preferably, the glue or other adhesive used is consumed and/or expelled from the copy machine during the stapling process so as to avoid having to perform any material removal from such copy machine or other device.

In a preferred embodiment, a plurality of sheets of staple wires is stacked vertically, horizontally, or in yet another orientation. Preferably, each sheet within such stack is bonded to adjacent sheets on both of its surfaces. An exception generally applies for sheets on either end of the stack, which would generally be bonded only to only one adjacent sheet. Preferably, the staple wires within one staple sheet are bonded to each other using preferably brittle glue which glue is left intact from the initial production of such staple sheet.

In a preferred embodiment, bonding along a second dimension would involve bonding staple wire plates together, after production of such plates, using glue or other adhesive which is either consumed and/or expelled from a copy machine or other host device as a consequence of the stapling process. Elimination of the glue or other adhesive residue from a copy machine stapling mechanism may occur by fragmenting the glue during each stapling operation and then expelling the fragmented glue residue from the stapling mechanism onto the paper or other media being stapled. Alternatively, heat could be employed to burn off the